

System key features

- Differential Pressure Loop Control allows for precise and total control of the transducer's performance.
- Differential Pressure Control loop allows for control and compensation of specific acoustic and radiation factors.
- Total repeatability of a system's acoustic performance.
- Unprecedented SPL level, as well as Distortion reduction capability that doubles the driver's output capability compared to a conventional design.
- Full set of equalization, filtering, limiting and delay tools for broad flexibility.
- Remote diagnostic, monitoring and programming capability. *
- PFC (Power Factor Corrected) High Efficiency, Self-Regulating power supply allows for 90 to 240 V universal mains usage while minimizing peak current absorption.
- Thiele/Small and Electromechanical parameter Dashboard enables the creation of a virtual and specifically tuned Transducer. *

* for OEM customer only

The transducers

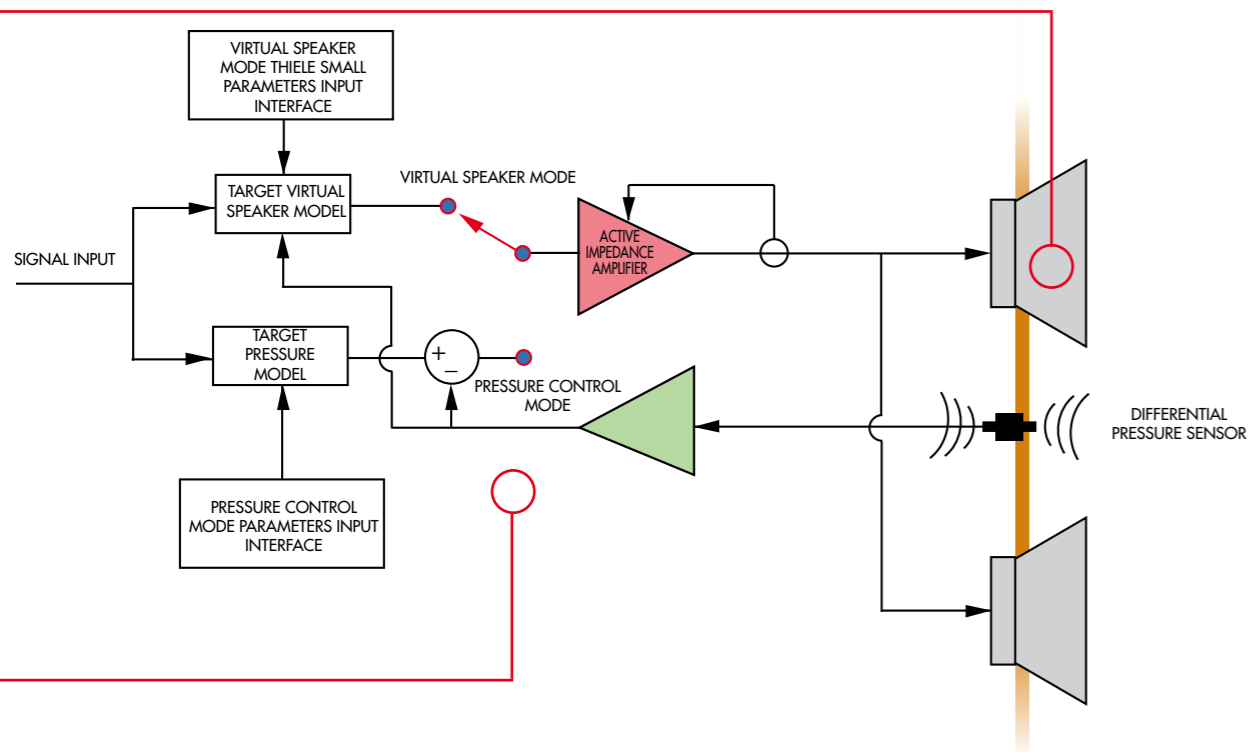


21iD



18iD

VOICE COIL DIAMETER & TECHNOLOGY	135 mm (5.3") Proprietary ISV Technology	135 mm (5.3") Proprietary ISV Technology
PROGRAM POWER HANDLING	3600W	3600W
MAX PEAK TO PEAK EXCURSION	70 mm (2.76")	70 mm (2.76")
SUSPENSION DESIGN	Extended Travel Double Silicon Spider (DSS)	Extended Travel Double Silicon Spider (DSS)
CONE MATERIAL	Carbon fiber reinforced treated cellulose pulp	Carbon fiber reinforced treated cellulose pulp



The IpalMod Module



IPALMOD

POWER AMP MODE	Switchmode Fixed Frequency Energy Recycling
PEAK OUTPUT POWER	8500 W
PEAK TO PEAK OUTPUT VOLTAGE	390V
PEAK TO PEAK OUTPUT CURRENT	240A
AVERAGE EFFICIENCY	95%

IPAL technology is covered by the following patents:

- PCT Patent N°: WO-2008-018099
- PCT Patent N°: PCT/IT98/00031
- U.S. patent N°: US 6,281,767 B1



18
EIGHTEEN
SOUND

PROFESSIONAL
LOUDSPEAKERS

IPAL LOUDSPEAKER SYSTEM

powered by



iPAL: A CLOSED LOOP HIGH EFFICIENCY SUBWOOFER SYSTEM

IPAL – Integrated Powered Adaptive Loudspeaker - An integrated combination of a Power Amplification Module, High Efficiency Transducer, Zero Latency DSP Core and a Fully Parametric Differential Pressure Loop Control. System linearity is idealized through a specially designed Eighteen Sound “iD Series” high-efficiency transducer and a specifically matched Powersoft amplifier with a Differential pressure-sensor correction that maximizes the control of the physical transducer.

This innovative approach allows the consistent increase of the ‘mains input-to-acoustic output’ efficiency through a combination of specifically matched amplifier and the 18” and 21” 18 Sound high-efficiency transducers. The IPAL system is controlled by the Powersoft DPC (Differential Pressure Loop Control) technology using a ‘Zero Latency’ DSP integrated into the Powersoft IPALMOD amplifier. The final result is unprecedented acoustic performance implemented by full boundary conditions processing.

THE TRANSDUCERS

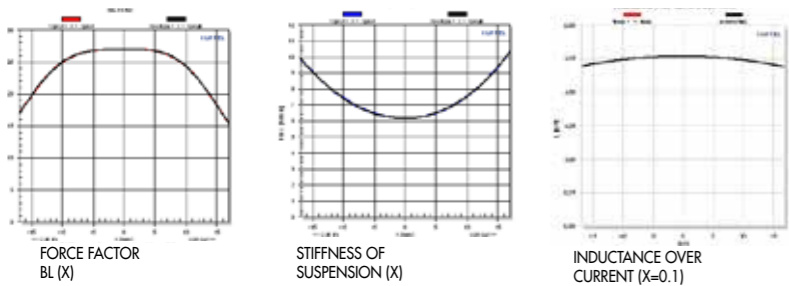
18iD & 21iD



The system is made by two neodymium 18” or 21” subwoofers. The 5.3” diameter voice coil has been designed using the ISV inside-outside technology, enabling the transducer to handle up to 3600W program power with minimum power compression.

Intrinsic Symmetric Design

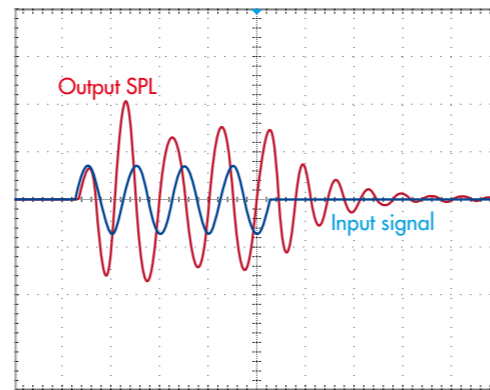
The transducer design include a large displacement suspension system specifically designed for matching the carbon fiber reinforced cellulose cone. Thanks to the Triple Silicon Spider (TSS) technology, the speaker is able to control the moving mass with high linearity, showing an exceptional stability of mechanical parameter values in the long term. Bl force factor, as well as all other electro-dynamic parameters, are linear within the working range.



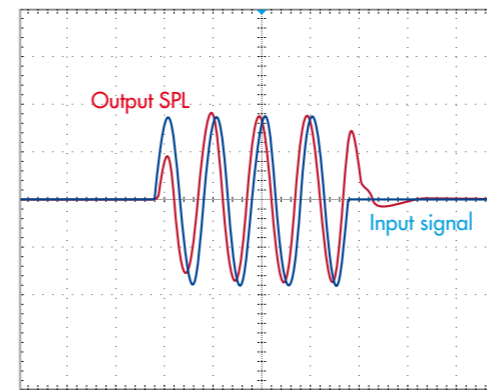
Active voice coil cooling



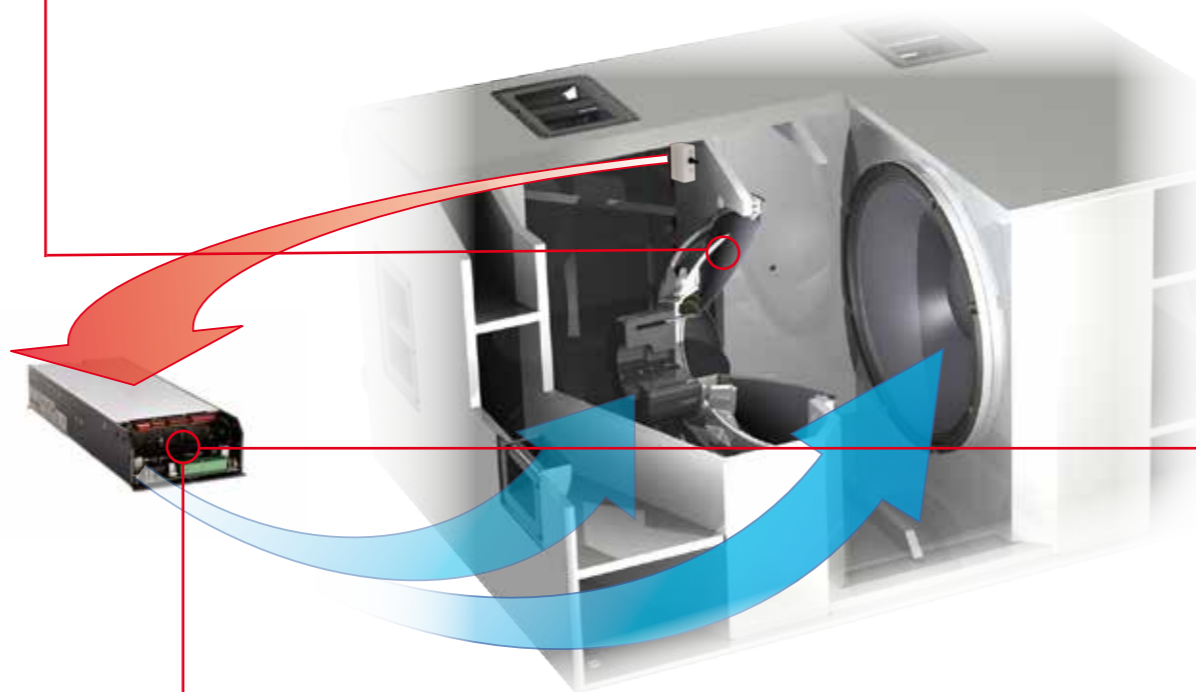
The transducer has been developed after intense FEA and fluidodynamics simulation and testing, in order to extract and dissipate the heat generated by the powerful 4” Tetra coil. The on-board aluminum heatsink acts as a cooling system, increasing the power handling capability and lowering the power compression figure.



CONTROL LOOP NOT ACTIVATED



CONTROL LOOP ACTIVATED



High Efficiency Amplifier | Transducer Integration

IPAL technology magnifies the native performances of efficiency and the “energy recycling” capabilities of Switch-Mode amplifier topology. Specific design and power optimized matching of the amplifier output stage and the transducer motor delivers an unprecedented value in terms of Acoustic Output to Mains Input Power Ratio.

DPC® | Differential Pressure Control

The Differential Pressure Control technology - DPC® - is the core of IPAL control method. Full characterization of the transducer and its acoustical load conditions allows to correct in real time the uncertainties of any acoustical system with state-of-the-art resulting performances.

Zero Latency | DSP

In the IPAL technology, processing is demanded to a specifically designed DSP core to minimize the In-Out latency of the system. An innovative architecture ensures 10uS latency on the critical feedback paths allows “analog type” feedback approach with the flexibility of a DSP core.

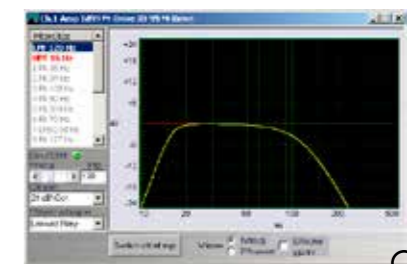
Applications

- Very High Output, High precision subwoofer systems
- High quality low frequency reproduction in difficult acoustic conditions
- VLF Acoustic space enhancing

THE AMPLIFIER

Comprehensive Computer Controlled Programming

IpalMod is fully controlled via PC software, that enables to setup and tune the system. A complete library of audio filters makes possible to create complete limiting, crossover and EQ setups. Real-time management and monitoring of all vital functions from a remote PC via an intuitive graphical user interface are also possible.



Input EQ and Filters

Pressure Control Mode

In the Pressure Control Mode, IPAL processes the pressure sensor signal using a target pressure model defined by the user. System linearity is guaranteed by a feedback correction that takes care of removing the limitations of physical transducers.



Front view pressure mode | Pressure mode control panel

Virtual Speaker Mode

DPC® and “Zero Latency” DSP technologies allowed to develop an amazingly powerful tool to built a so called “Virtual speaker”, giving the real speaker to behave accordingly to an “user defined” transducer. A software dashboard is provided for managing the Thiele – Small electromechanical parameters of the desired driver. Virtual Speaker Modeling relies its behaviour on a mathematical model, therefore all possible transducer alterations due to production tolerances as well as aging effects, but even power compression, are virtually eliminated.



Front view virtual speaker mode | Virtual speaker panel